THE DATASHEET OF

SPNH100.XXDL

POWR-GARD® Fuse Datasheet

SPF SERIES SOLAR FUSES

1000 V dc • 1–30 A

Description

The SPF Solar Protection Fuse series has been specifically designed for the protection of photovoltaic (PV) systems. This family of midget-style fuses (10 x 38 mm) can safely protect PV modules and conductors from reverse-overcurrent conditions.

As PV systems have grown in size, so have the corresponding voltage requirements. This increase in system voltage has typically been intended to minimize power loss associated with long conductor runs. Standard circuit protection devices are not designed to completely protect photovoltaic panels. However, the SPF series is UL Listed to safely interrupt faulted circuits up to this demanding voltage level.

Littelfuse offers multiple ampere ratings to match specific requirements in a variety of applications.

Features/Benefits

- Full range, fast-acting fuse helps eliminate common low-overload faults
- Prevents power generation losses due to nuisance tripping from changes in temperature
- Both PCB mount and dead-front holder options available

Applications

- Inverters
- Combiner boxes
- Battery charge controllers

Recommended Accessories

Fuse Holder: LPHV 1000 V dc POWR-Safe Series
Fuse Clips: 125003

Web Resources

Download technical documents: **Littelfuse.com/SPF**

Specifications

Voltage Rating	1000 V dc
Amperage Rating	1, 2, 3, 3.5, 4, 5, 6, 8, 10, 12, 15, 20, 25, 30
Max. Interrupting Rating	20 kA - 1 A - 20 A 50 kA - 25 A - 30 A
Time Constant	≤ 2ms
Material	Body: Melamine Caps: Copper Alloy
Approvals	UL Listed (File: E339112) CSA Certified (File: 029862_0_000) TUV (Cert: J 50494849)
Applicable Standards	UL 248-1, 248-19 IEC 60269-6
Environmental	RoHS Compliant
Country of Origin	Mexico

Part Numbering System

0SPF xxxx H XR

Series

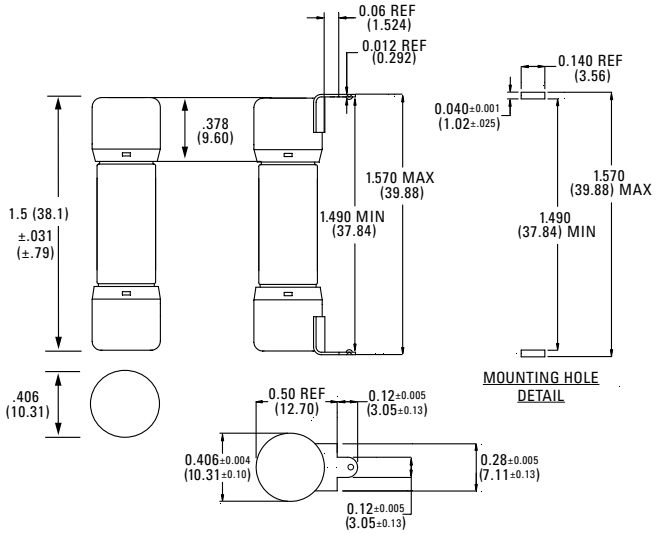
Amp Code
Refer to Ordering Information table

Mounting Options
Blank = Ferrule
XR = PCB

Package Quantity
T = 10 Fuses
H = 100 Fuses

Dimensions Inches (mm)

Ferrule Version **PCB Version**



Look for this logo to indicate products that are used in solar applications. Visit our website **littelfuse.com/solar** for the latest updates on approvals, certifications, and new products.

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Ordering Information
Ferrule Version

SERIES	AMPERAGE	AMPERE CODE	CATALOG NUMBER	PRODUCT MARKING	PACKING QUANTITY	ORDERING NUMBER	UPC CODE
SPF	1	001.	SPF001	SPF 1A	10	0SPF001.T	07945816907
					100	0SPF001.H	07945816908
SPF	2	002.	SPF002	SPF 2A	10	0SPF002.T	07945816910
					100	0SPF002.H	07945816911
SPF	3	003.	SPF003	SPF 3A	10	0SPF003.T	07945816913
					100	0SPF003.H	07945816914
SPF	3.5	03.5	SPF03.5	SPF 3-½A	10	0SPF03.5T	07945880087
					100	0SPF03.5H	07945880088
SPF	4	004.	SPF004	SPF 4A	10	0SPF004.T	07945816916
					100	0SPF004.H	07945816917
SPF	5	005.	SPF005	SPF 5A	10	0SPF005.T	07945816919
					100	0SPF005.H	07945816920
SPF	6	006.	SPF006	SPF 6A	10	0SPF006.T	07945816922
					100	0SPF006.H	07945816923
SPF	8	008.	SPF008	SPF 8A	10	0SPF008.T	07945816925
					100	0SPF008.H	07945816926
SPF	10	010.	SPF010	SPF 10A	10	0SPF010.T	07945816928
					100	0SPF010.H	07945816929
SPF	12	012.	SPF012	SPF 12A	10	0SPF012.T	07945816931
					100	0SPF012.H	07945816932
SPF	15	015.	SPF015	SPF 15A	10	0SPF015.T	07945816934
					100	0SPF015.H	07945816935
SPF	20	020.	SPF020	SPF 20A	10	0SPF020.T	07945816937
					100	0SPF020.H	07945816938
SPF	25	025.	SPF025	SPF 25A	10	0SPF025.T	07945817595
					100	0SPF025.H	07945817596
SPF	30	030.	SPF030	SPF 30A	10	0SPF030.T	07945817598
					100	0SPF030.H	07945817599

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Ordering Information
PCB Version

SERIES	AMPERAGE	AMPERE CODE	CATALOG NUMBER	PRODUCT MARKING	PACKING QUANTITY	ORDERING NUMBER	UPC CODE
SPF	1	001.	SPF001R	SPF 1A-R	100	0SPF001.HXR	07945816909
SPF	2	002.	SPF002R	SPF 2A-R	100	0SPF002.HXR	07945816912
SPF	3	003.	SPF003R	SPF 3A-R	100	0SPF003.HXR	07945816915
SPF	3.5	03.5	SPF03.5R	SPF 3-½A-R	100	0SPF03.5.HXR	07945880089
SPF	4	004.	SPF004R	SPF 4A-R	100	0SPF004.HXR	07945816918
SPF	5	005.	SPF005R	SPF 5A-R	100	0SPF005.HXR	07945816921
SPF	6	006.	SPF006R	SPF 6A-R	100	0SPF006.HXR	07945816924
SPF	8	008.	SPF008R	SPF 8A-R	100	0SPF008.HXR	07945816927
SPF	10	010.	SPF010R	SPF 10A-R	100	0SPF010.HXR	07945816930
SPF	12	012.	SPF012R	SPF 12A-R	100	0SPF012.HXR	07945816933
SPF	15	015.	SPF015R	SPF 15A-R	100	0SPF015.HXR	07945816936
SPF	20	020.	SPF020R	SPF 20A-R	100	0SPF020.HXR	07945817594
SPF	25	025.	SPF025R	SPF 25A-R	100	0SPF025.HXR	07945817597
SPF	30	030.	SPF030R	SPF 30A-R	100	0SPF030.HXR	07945817600

Electrical Specifications

AMPERAGE	AMPERE CODE	CATALOG NUMBER (FERRULE)	CATALOG NUMBER (PCB)	VOLTAGE	INTERRUPTING RATING (KA)	NOM COLD RESISTANCE (OHM)	WATTS LOSS AT 100 % RATED CURRENT (W)	WATTS LOSS AT 80 % RATED CURRENT (W)	TOTAL CLEARING I²T (A2S) 20 KA	TOTAL CLEARING I²T (A2S) 50 KA	AGENCY APPROVALS		
				DC	DC						UL	CSA	TUV
1	001.	SPF001	SPF001R	1000	20	0.394	0.60	0.41	0.6	–	•	•	•
2	002.	SPF002	SPF002R	1000	20	0.154	1.59	0.85	4.8	–	•	•	•
3	003.	SPF003	SPF003R	1000	20	0.110	1.50	0.82	7.9	–	•	•	•
3.5	03.5	SPF03.5	SPF03.5R	1000	20	0.078	1.37	0.78	11	–	•	•	•
4	004.	SPF004	SPF004R	1000	20	0.061	1.49	0.84	23	–	•	•	•
5	005.	SPF005	SPF005R	1000	20	0.041	1.47	0.86	43	–	•	•	•
6	006.	SPF006	SPF006R	1000	20	0.028	1.35	0.77	80	–	•	•	•
8	008.	SPF008	SPF008R	1000	20	0.018	1.61	0.91	199	–	•	•	•
10	010.	SPF010	SPF010R	1000	20	0.013	1.76	1.00	401	–	•	•	•
12	012.	SPF012	SPF012R	1000	20	0.010	1.97	1.11	642	–	•	•	•
15	015.	SPF015	SPF015R	1000	20	0.008	2.28	1.38	505	–	•	•	•
20	020.	SPF020	SPF020R	1000	20	0.005	2.81	1.57	1313	–	•	•	•
25	025.	SPF025	SPF025R	1000	20	0.004	3.33	1.88	2141	2433	•	•	•
30	030.	SPF030	SPF030R	1000	20	0.003	3.85	2.15	3290	3810	•	•	•

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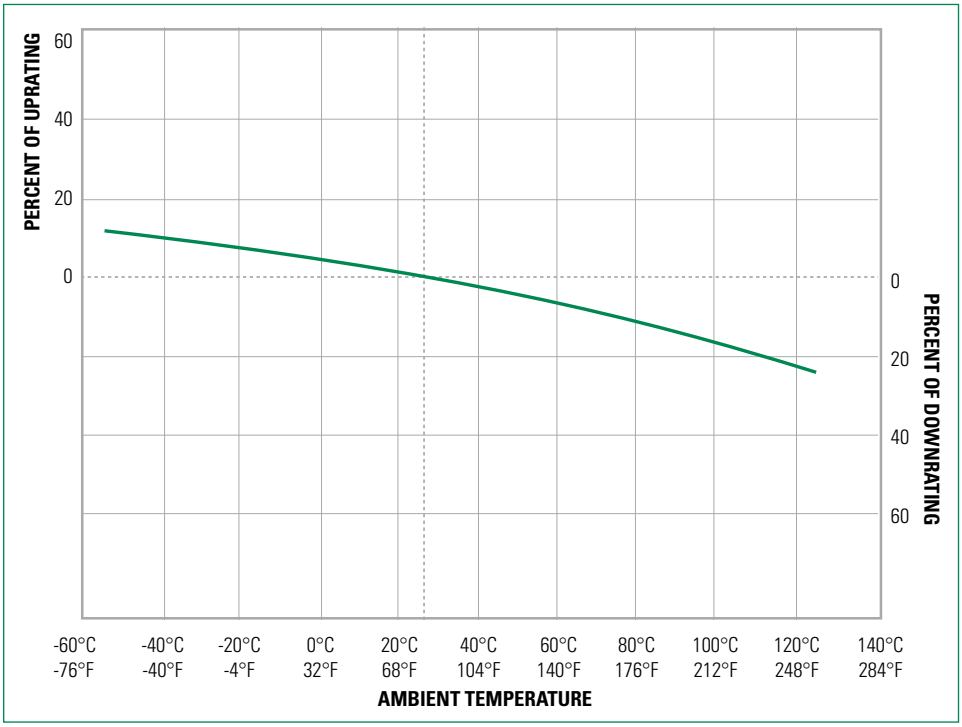
Electrical Specification – Agency Requirements

AMPERAGE RATING	OPENING TIME (MINUTES)			
	100 % of Amp Rating per UL	105 % of Amp Rating per IEC	135 % of Amp Rating per UL	200 % of Amp Rating per UL
1–30	Temperature Stabilization	60 Min	60 Max	4 Max

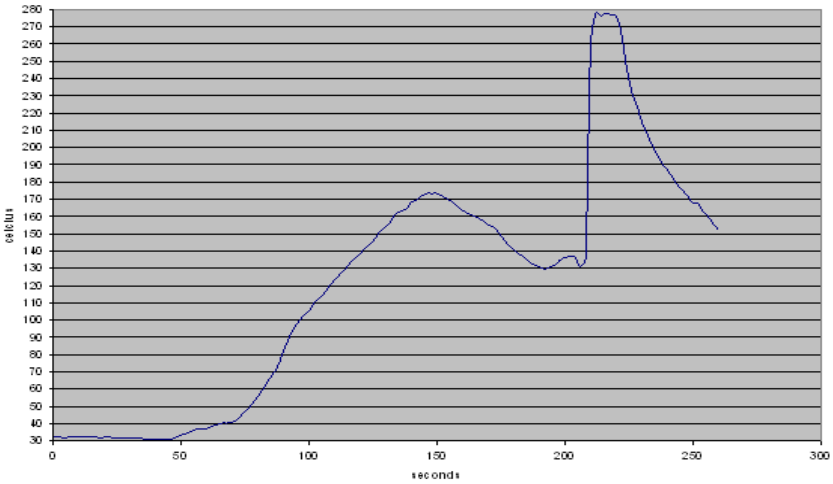
Temperature Derating Curve (temperature of air immediately surrounding fuse)



Recommended Process Parameters

WAVE PARAMETER	LEAD FREE RECOMMENDATION
Preheat:	(Typical industry recommendation)
Temperature minimum:	130 °C
Temperature maximum:	—
Pre-heat time	75 seconds maximum
Solder pot temperature	280 °C maximum
Solder dwell time	270 °C for 8 seconds maximum
Complete cycle time	250 seconds maximum

Soldering Parameters



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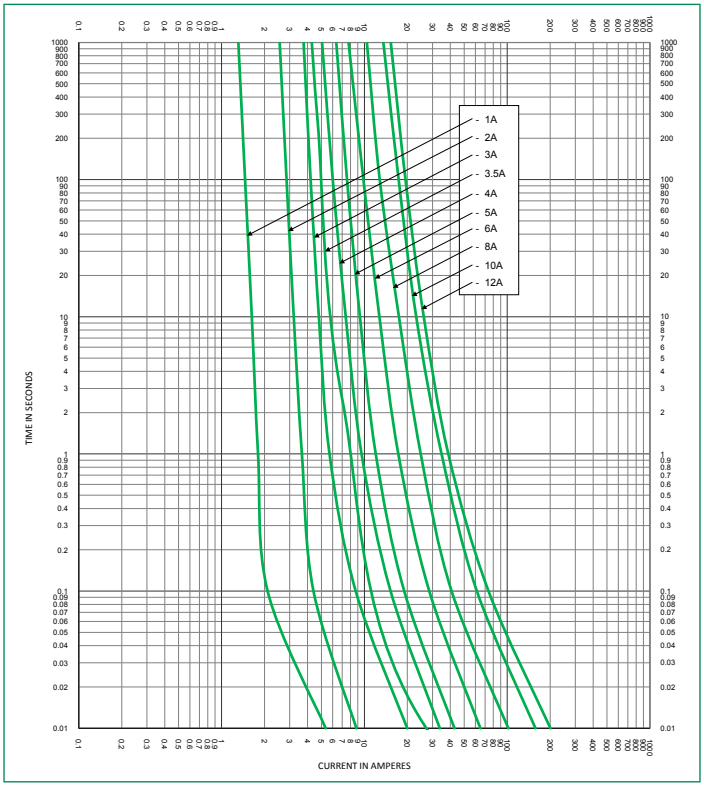
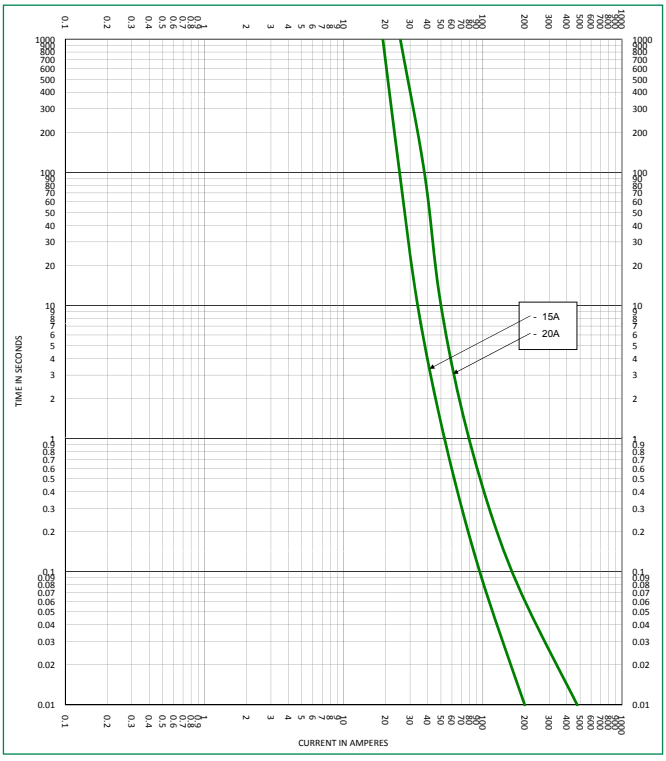
Time Current Curve (1–12 A)



Time Current Curve (15–20 A)



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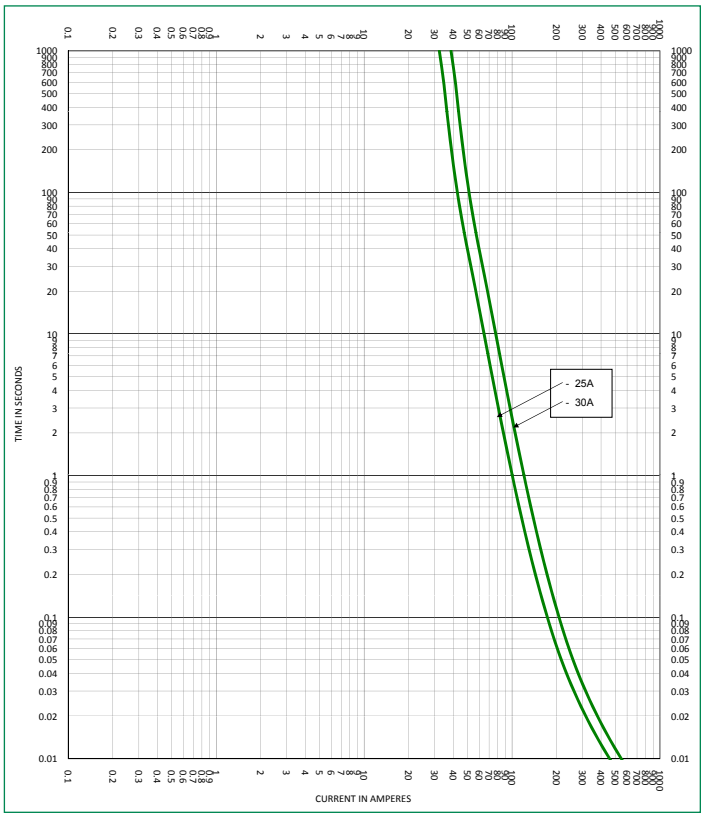
Time Current Curve (25–30 A)



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